



# **Governor's Drought Advisory Committee Meeting**

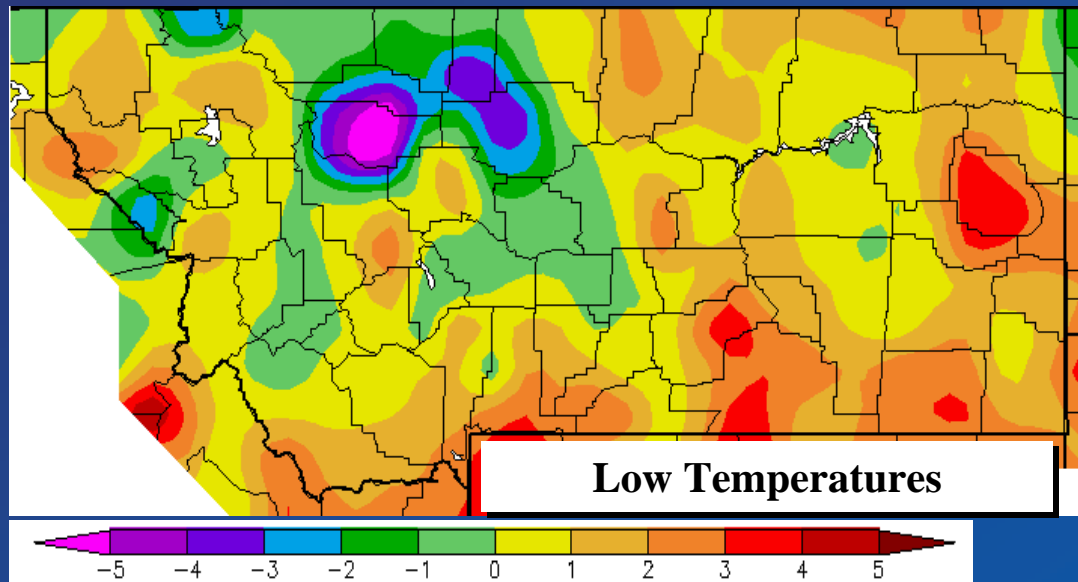
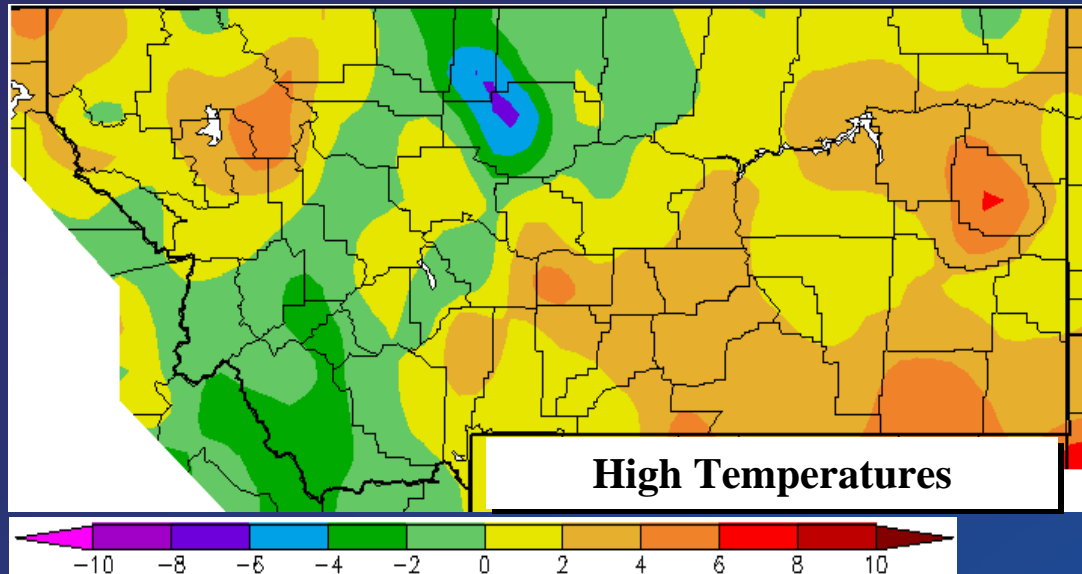
**October 17, 2007**

**National Weather Service**

**Gina Loss**

# Temperature Anomalies

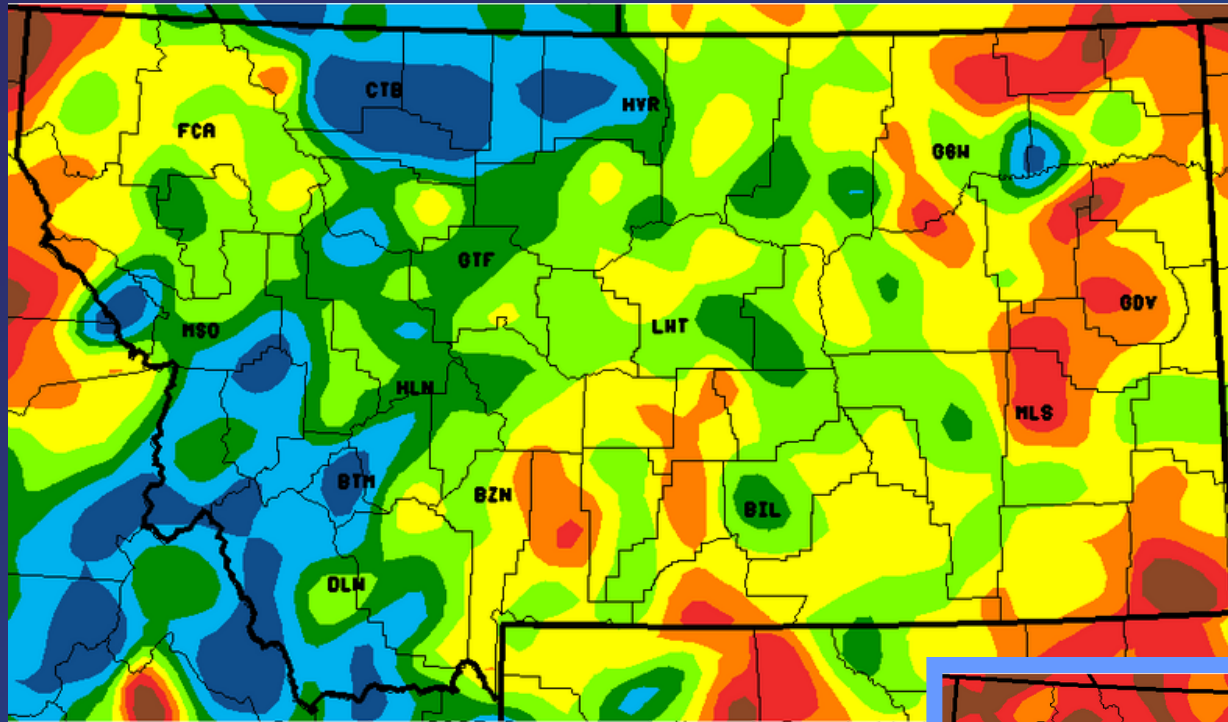
## September 2007



- Temperatures averaged near normal
  - *Highs mostly within 2 degrees of normal*
    - Band below normal southwest to north central
  - *Lows mostly near to 4 degrees above normal*
    - Rocky Mountain Front and adjacent plains near to 4 degrees below normal

# Percent of Normal Precipitation

## September 2007



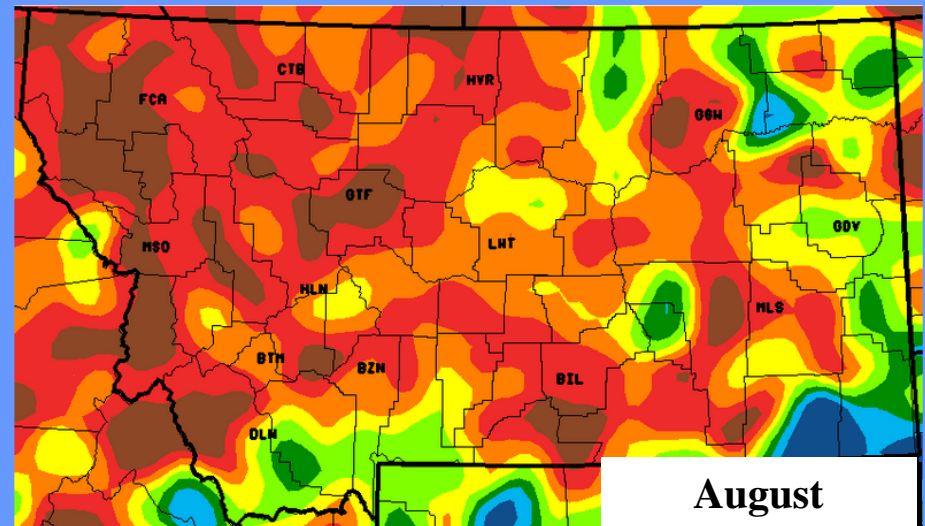
September 2007 Percent of Normal Precipitation  
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

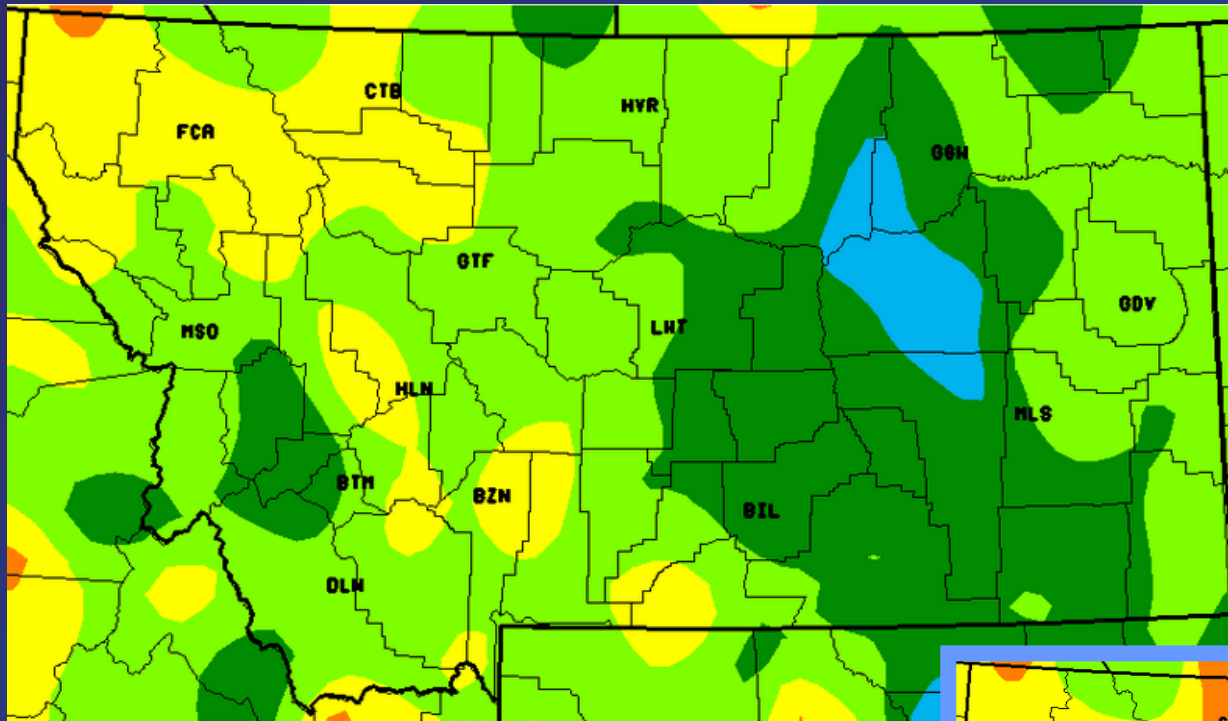
<http://>

- Nearly half of state near to above normal
  - Areas well above normal southwest and north central
- Isolated areas northwest... northeast and southeast well below normal



August

# Percent of Normal Precipitation Water Year 2007



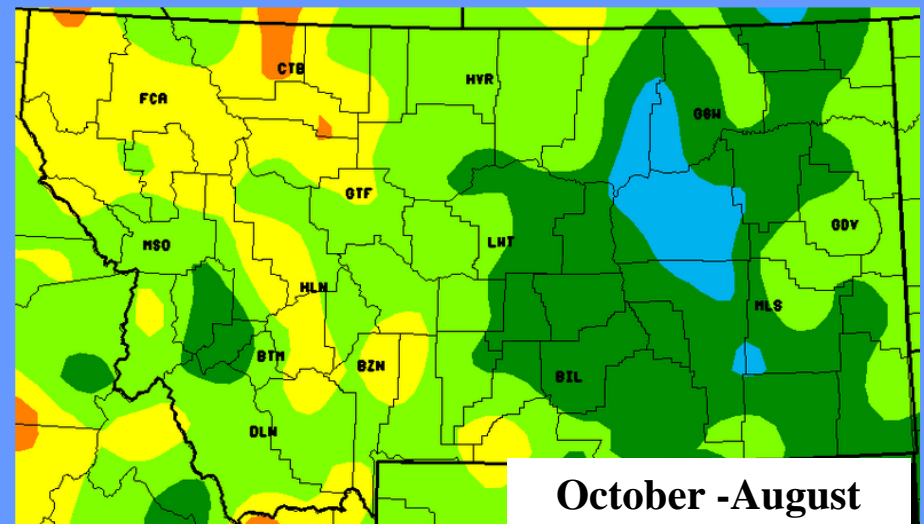
- October 2006 – September 2007
- Most of state ended near to above normal
- Areas northwest below normal
  - Also isolated areas southwest and south central

Oct 2006-Sep 2007 Percent of Normal Precipitation  
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.mt.gov>



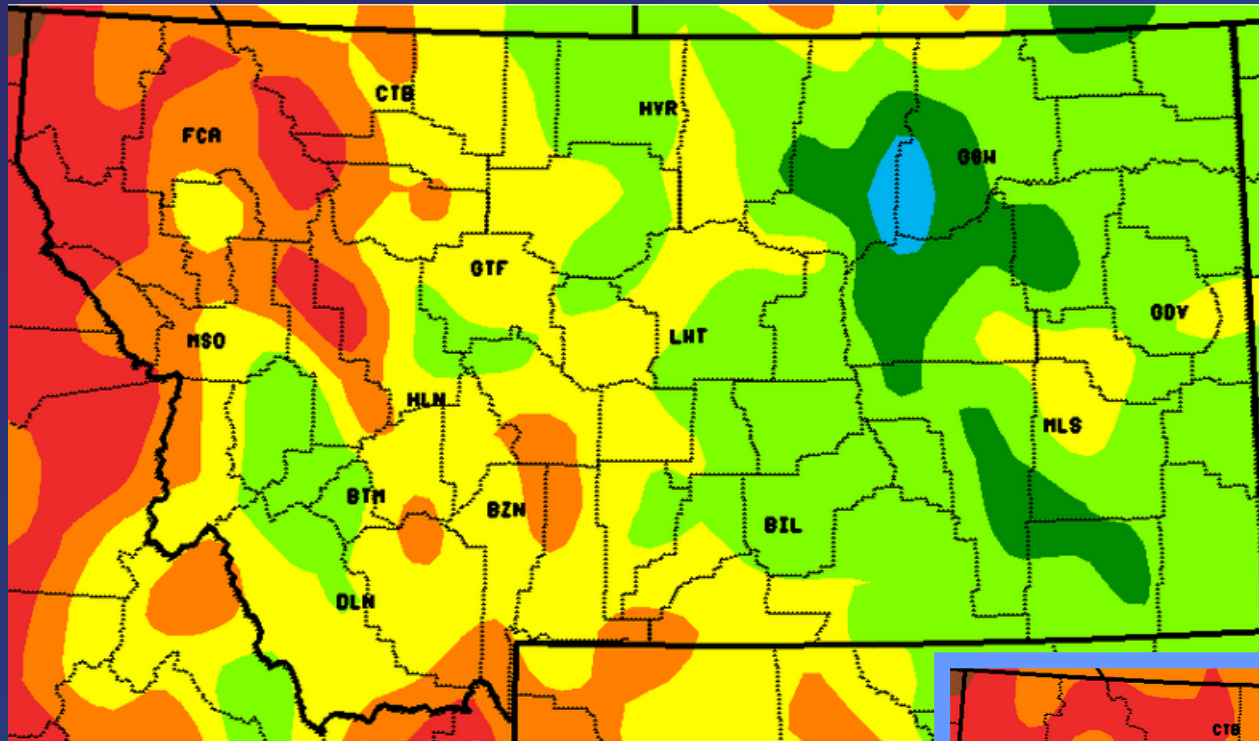
October - August



# Percent of Normal Precipitation

## Crop Year 2007

- April – September 2007
- West mostly below to well below normal
- East mostly near to above normal

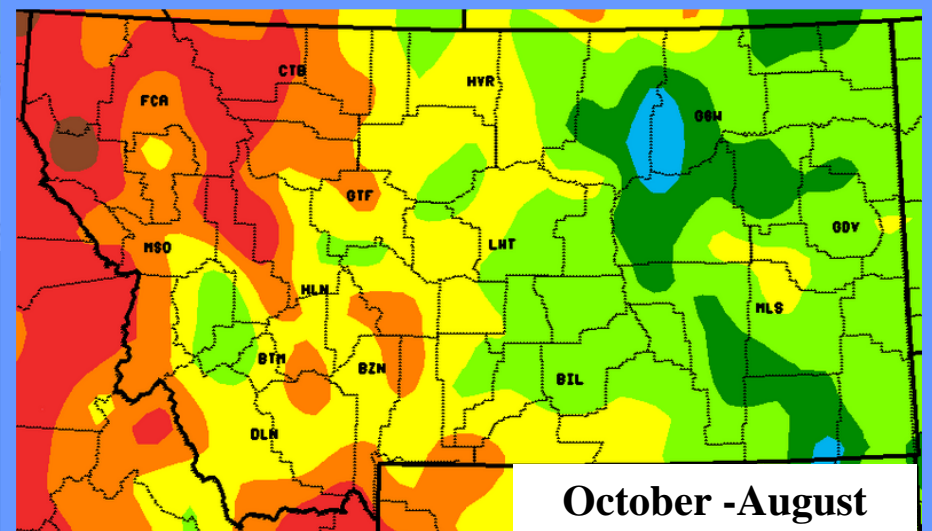


Apr-Sep 2007 Percent of Normal Precipitation  
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

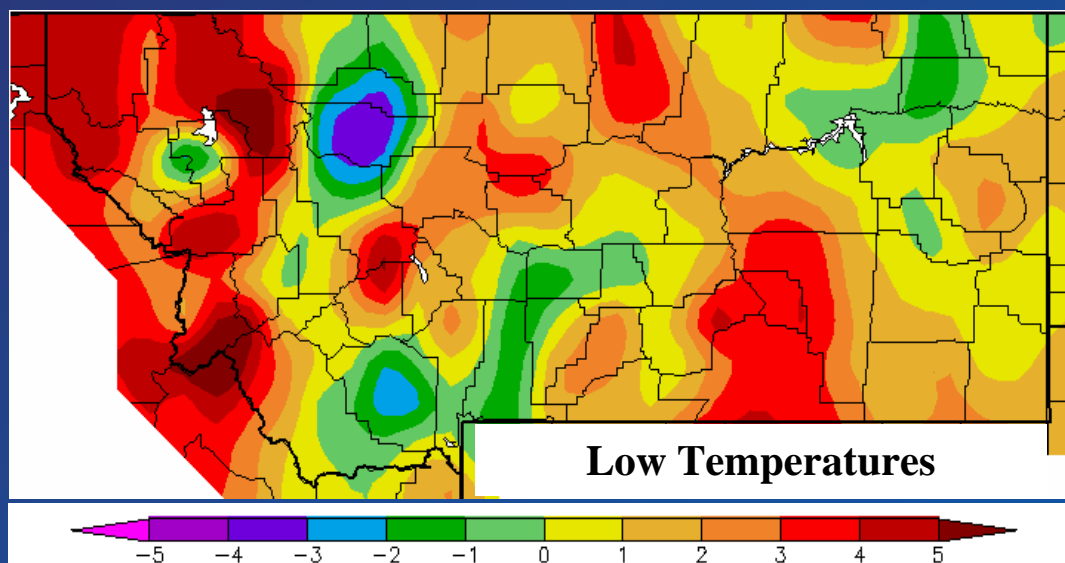
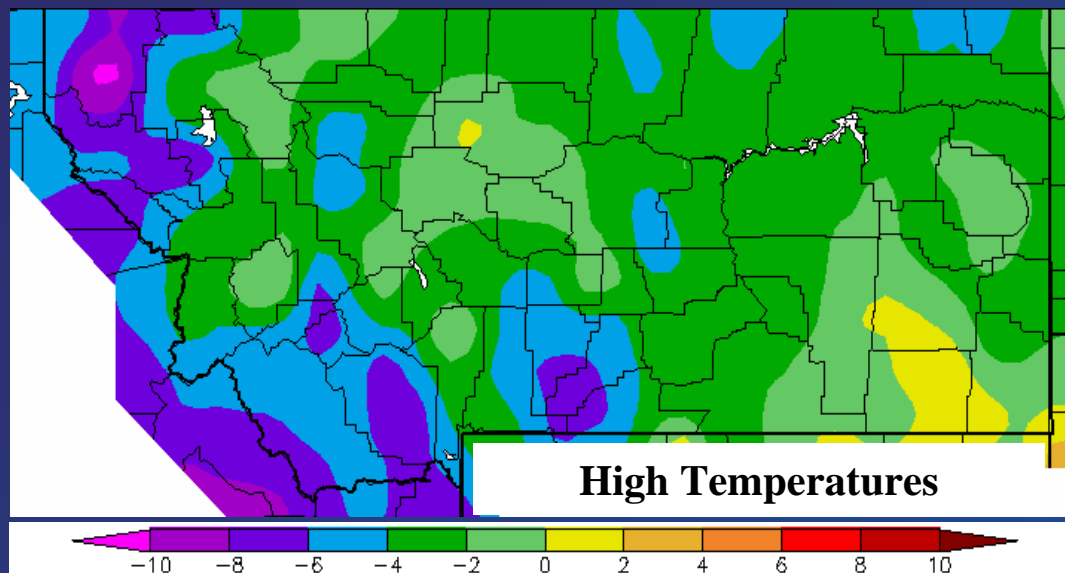
<http://>



October -August

# Temperature Anomalies

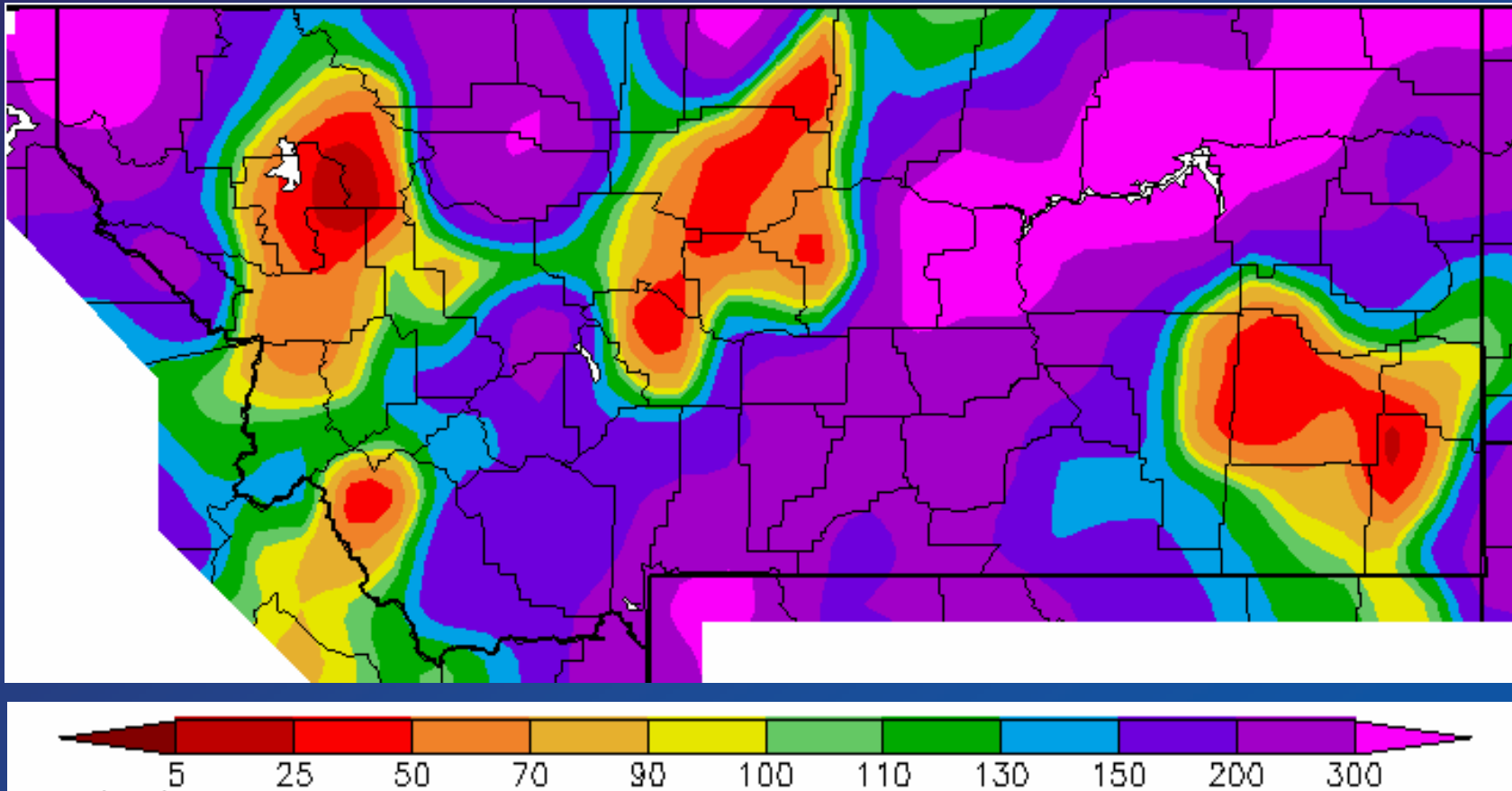
October 1 - 15, 2007



- Temperatures averaging below normal over most of Montana
- Highs
  - West... 2 to 8 degrees below normal
  - East... 2 to 6 degrees below normal
- Lows
  - West... 3 to 5 degrees above normal
  - East... near to 4 degrees above normal

# Percent of Average Precipitation

## October 1 - 15, 2007



💧 **Most of state at more than 150% of normal**

# Precipitation Totals

## October and Water Year 2007

	OCTOBER 1 - 15				WATER YEAR TO DATE			
	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML
<b>WESTERN MONTANA</b>								
BUTTE	0.70	0.45	0.25	156	0.70	0.45	0.25	156
KALISPELL	0.49	0.45	0.04	109	0.49	0.45	0.04	109
MISSOULA	0.21	0.30	-0.09	70	0.21	0.30	-0.09	70
<b>SOUTHWEST MONTANA</b>								
BIG SKY	1.56	0.75	0.81	208	1.56	0.75	0.81	208
BOULDER	0.56	0.30	0.26	187	0.56	0.30	0.26	187
BELGRADE FIELD	1.07	0.60	0.47	178	1.07	0.60	0.47	178
BOZEMAN MSU	1.63	0.83	0.80	196	1.63	0.83	0.80	196
DILLON AIRPORT	0.61	0.33	0.28	185	0.61	0.33	0.28	185
ENNIS	0.89	0.54	0.35	165	0.89	0.54	0.35	165
HELENA	0.77	0.31	0.46	248	0.77	0.31	0.46	248
ROGERS PASS 9 NNE	0.72	0.65	0.07	111	0.72	0.65	0.07	111
TOWNSEND	0.46	0.30	0.16	153	0.46	0.30	0.16	153
W YELLOWSTONE	0.00	0.60	-0.60	0	0.00	0.60	-0.60	0
WISDOM	0.18	0.39	-0.21	46	0.18	0.39	-0.21	46

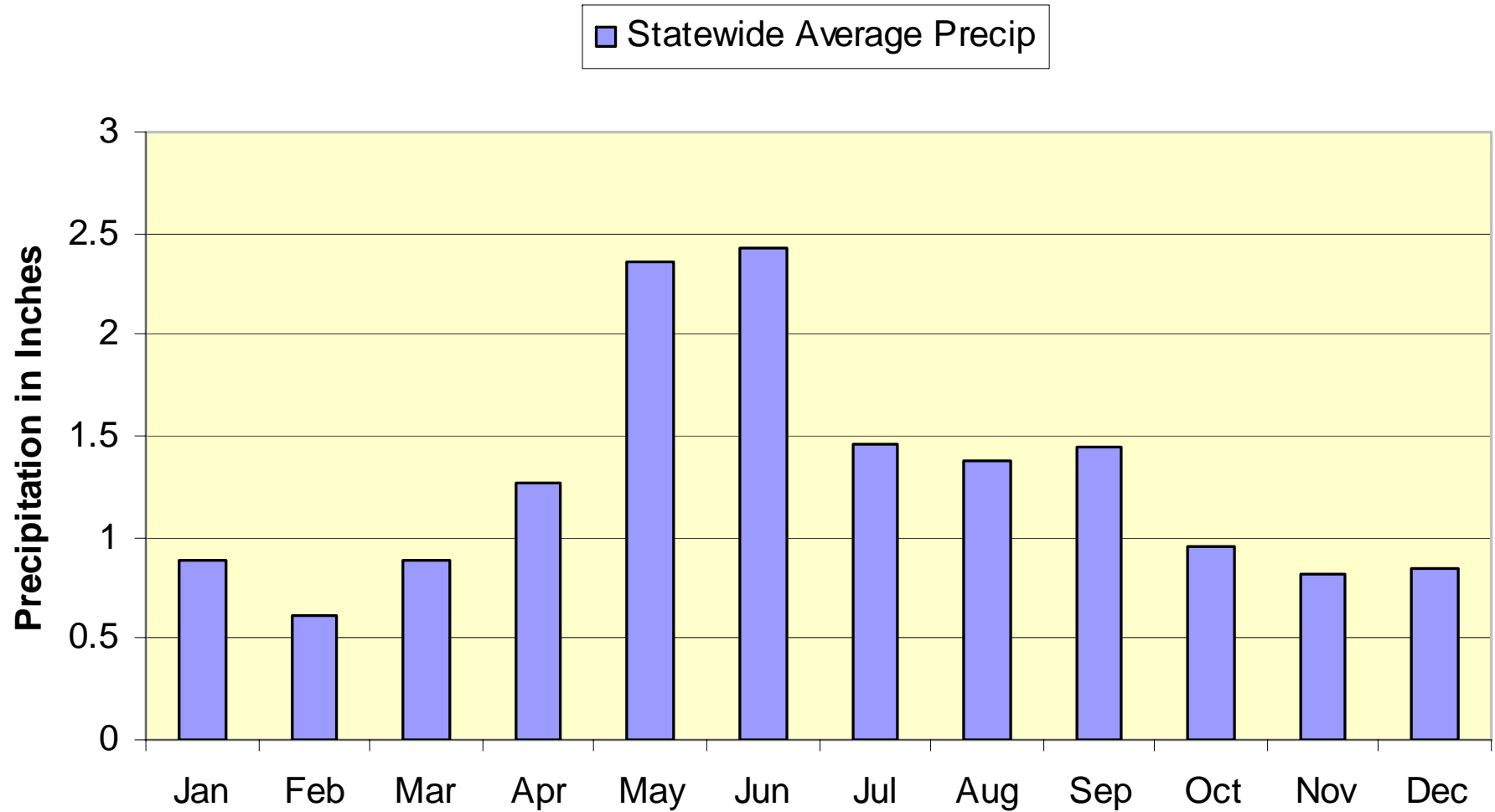


# Precipitation Totals

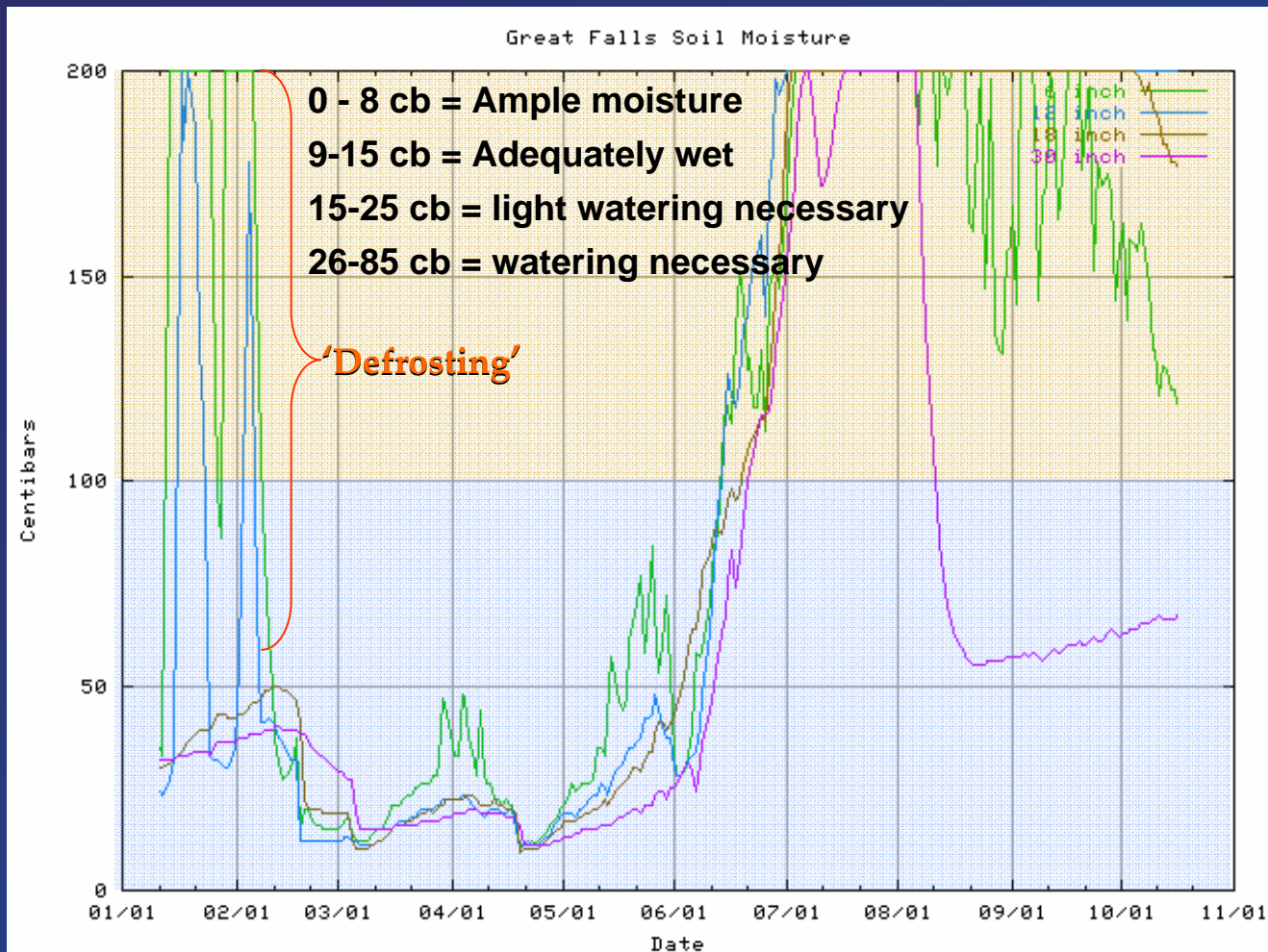
## October and Water Year 2007

	OCTOBER 1 - 15				WATER YEAR TO DATE			
	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML
<b>CENTRAL MONTANA</b>								
BILLINGS	1.56	0.67	0.89	233	1.56	0.67	0.89	233
CASCADE 20 SSE	0.70	0.52	0.18	135	0.70	0.52	0.18	135
CHESTER	0.30	0.30	0.00	100	0.30	0.30	0.00	100
CHOTEAU	0.80	0.30	0.50	267	0.80	0.30	0.50	267
CONRAD	0.05	0.30	-0.25	17	0.05	0.30	-0.25	17
CUT BANK	0.69	0.31	0.38	223	0.69	0.31	0.38	223
FORT ASSINNIBOINE	0.23	0.45	-0.22	51	0.23	0.45	-0.22	51
FORT BENTON	0.00	0.45	-0.45	0	0.00	0.45	-0.45	0
GOLD BUTTE 7 N	0.62	0.42	0.20	148	0.62	0.42	0.20	148
GRASS RANGE	1.61	0.48	1.13	335	1.61	0.48	1.13	335
GREAT FALLS	0.46	0.47	-0.01	98	0.46	0.47	-0.01	98
HARLEM	0.48	0.37	0.11	130	0.48	0.37	0.11	130
HAVRE	0.20	0.33	-0.13	61	0.20	0.33	-0.13	61
LIVINGSTON	1.31	0.63	0.68	208	1.31	0.63	0.68	208
LEWISTOWN	0.61	0.58	0.03	105	0.61	0.58	0.03	105
MARTINSDALE 3 NNW	0.78	0.45	0.33	173	0.78	0.45	0.33	173
NEIHART 8 NNW	0.37	0.74	-0.37	50	0.37	0.74	-0.37	50
SHELBY	0.50	0.20	0.30	250	0.50	0.20	0.30	250
STANFORD	0.35	0.53	-0.18	66	0.35	0.53	-0.18	66
SWEET GRASS	0.00	0.37	-0.37	0	0.00	0.37	-0.37	0
VALIER	0.93	0.32	0.61	291	0.93	0.32	0.61	291
WHITE SULPHUR SPRGS	0.35	0.55	-0.20	64	0.35	0.55	-0.20	64
<b>EASTERN MONTANA</b>								
GLASGOW	1.42	0.39	1.03	364	1.42	0.39	1.03	364
MILES CITY	0.25	0.60	-0.35	42	0.25	0.60	-0.35	42

# Statewide Average Precipitation



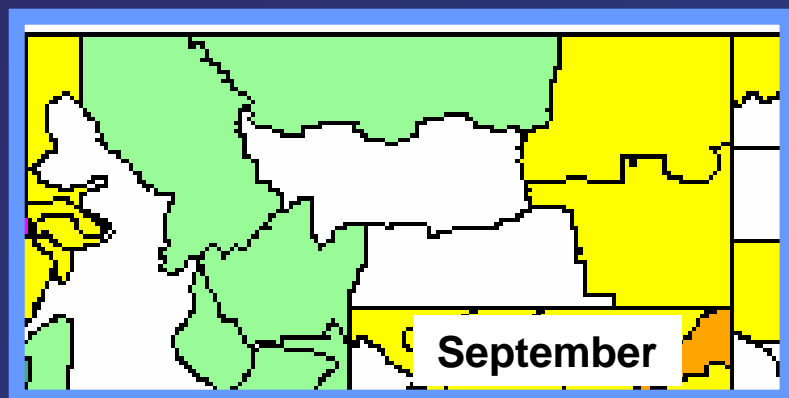
# Great Falls Soil Moisture



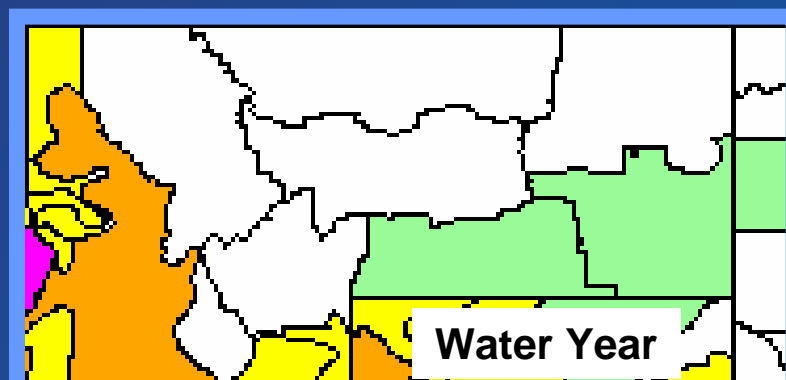
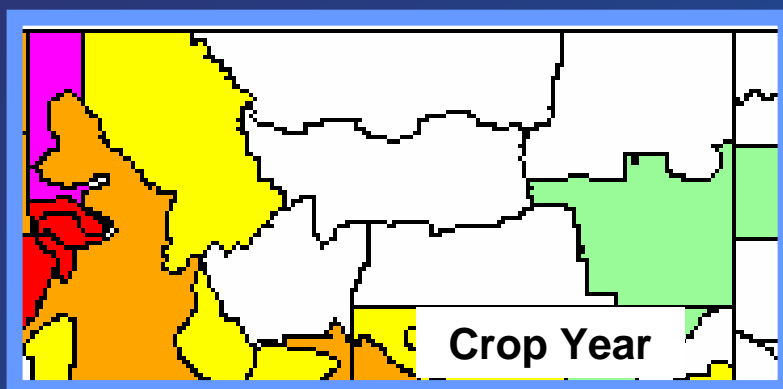
- 6" - 118cb
- 12" - 200cb
- 18" - 184cb
- 30" - 67cb

# 1...6 and 12 Month Precipitation Percentile

## September 2007



- Represents the likelihood that the precipitation value observed over the number of months indicated would not be exceeded.



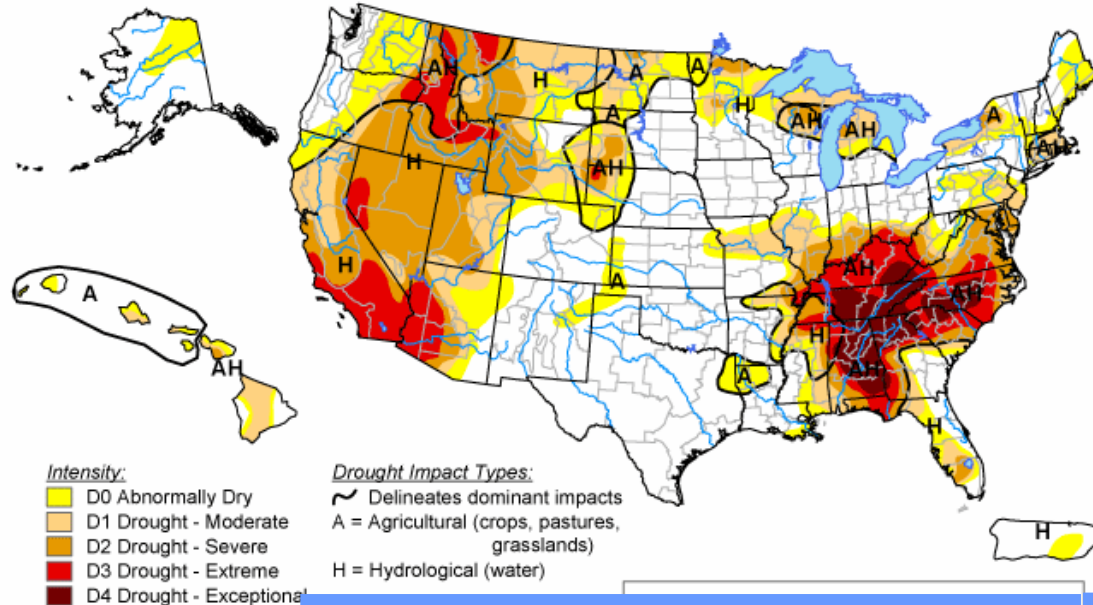
98% and above
95.0% to 97.9%
87.5% to 94.9%
66.6% to 87.4%
33.4% to 66.5%
12.6% to 33.3%
5.1% to 12.5%
2.1% to 5.0%
2.0% and below

# National Drought Monitor

Issued October 11, 2007

## U.S. Drought Monitor

October 9, 2007  
Valid 8 a.m. EDT



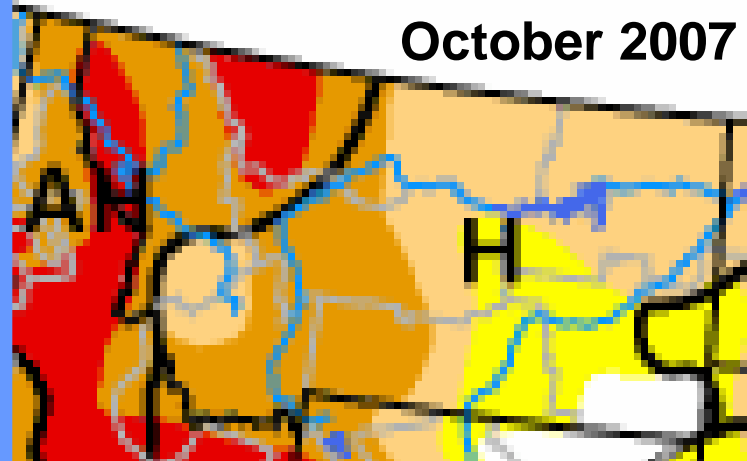
The Drought Monitor focuses on the current situation. Local conditions may vary. See the website for forecast statements.

<http://drought.unl.edu>

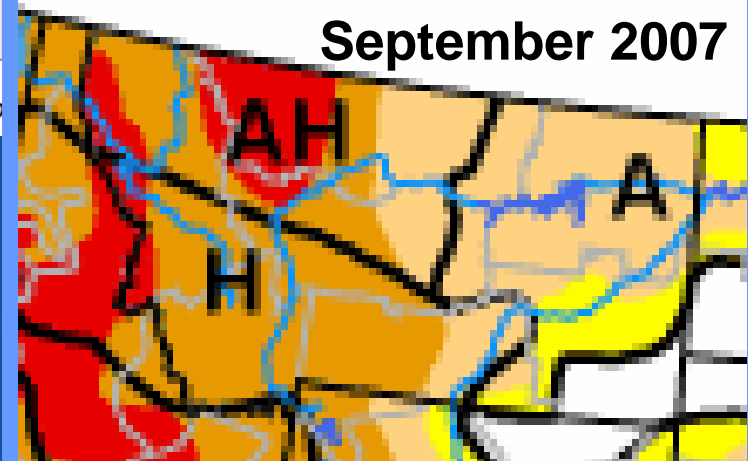
### 💧 Slight drought improvement

- West central improved from Severe/D2 to Moderate/D1
- South central and central improved from Moderate/D1 to Abnormally Dry/D0

October 2007



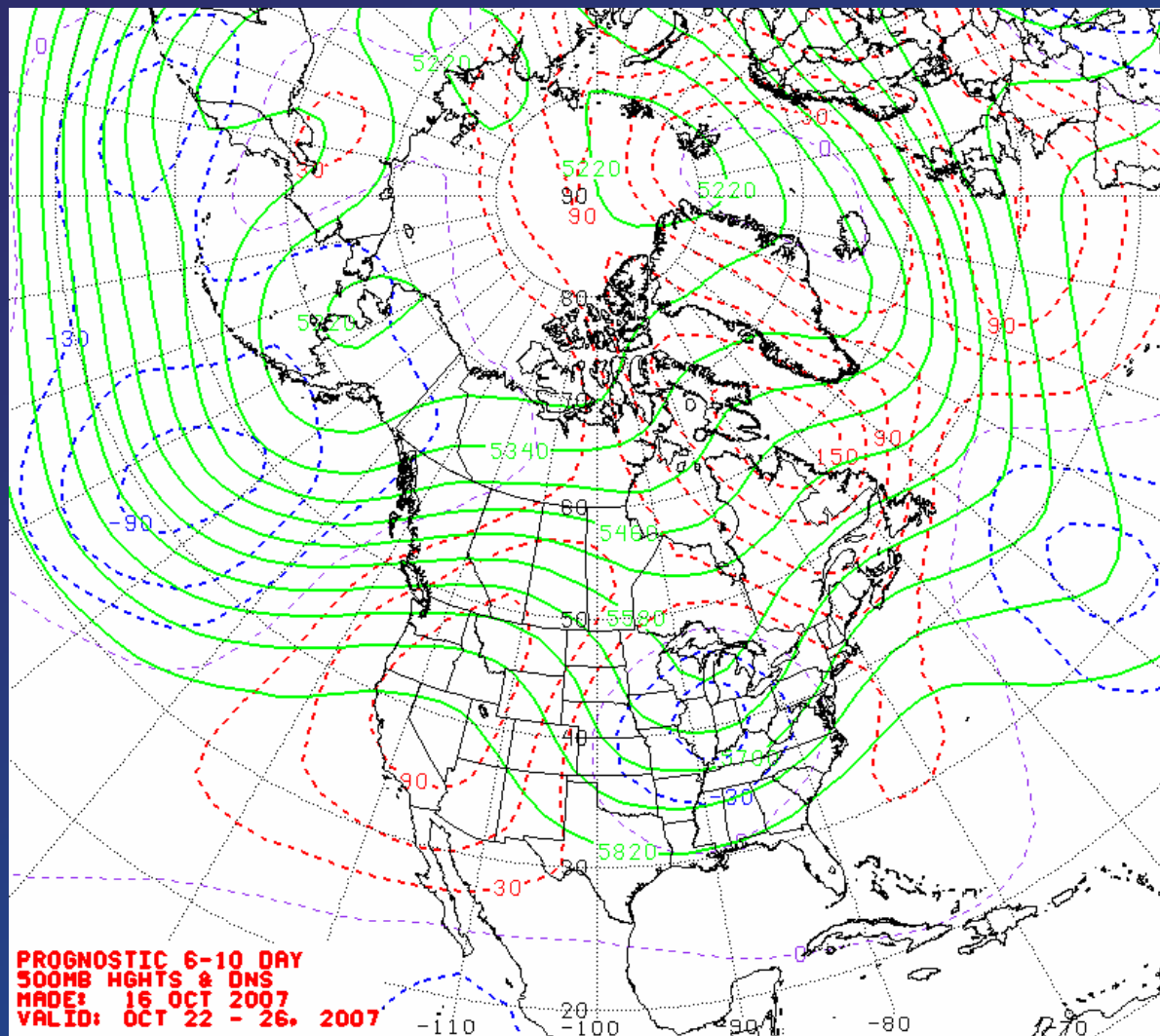
September 2007





# 6 – 10 Day Forecast

## 500 mb pattern

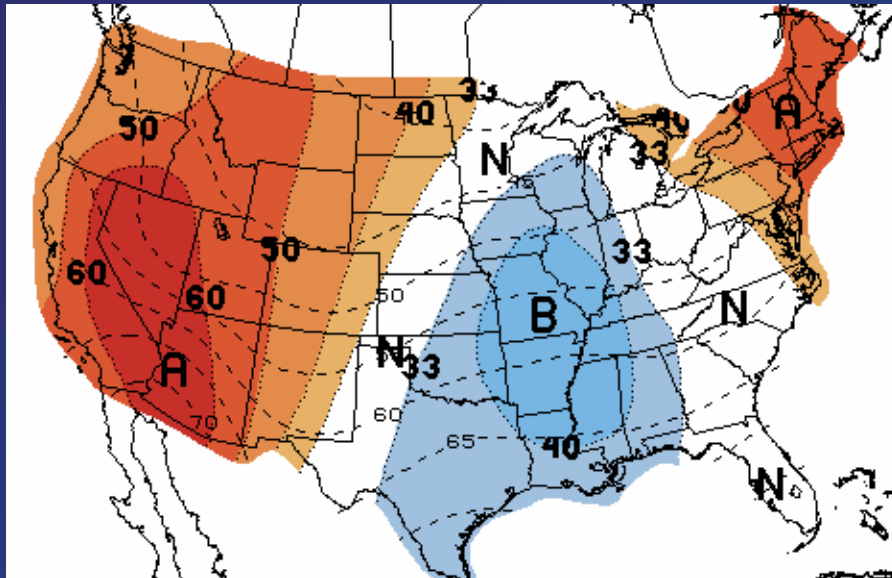


- October 22-26
- High pressure ridge over western U.S.

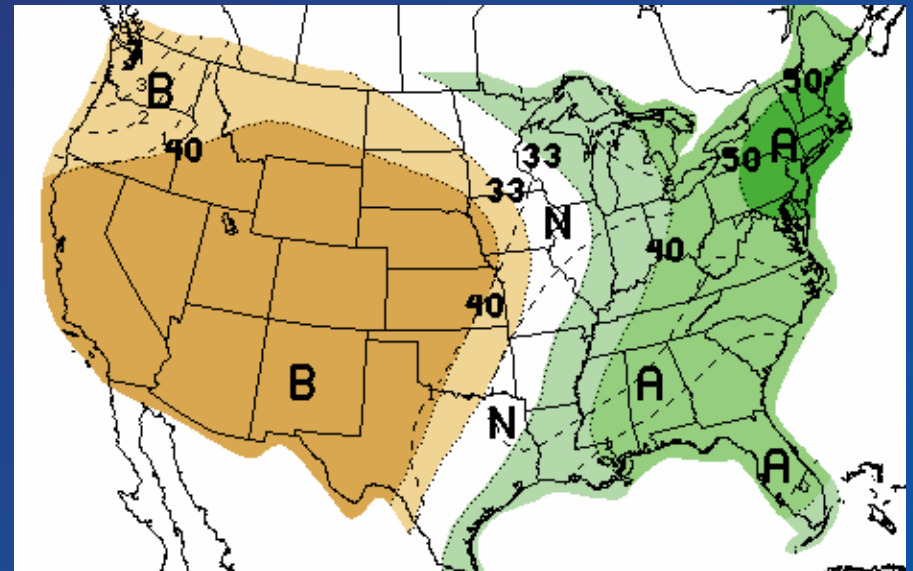
# 6 – 10 Day Forecast

## Temperature and Precipitation Outlook

### October 22-26



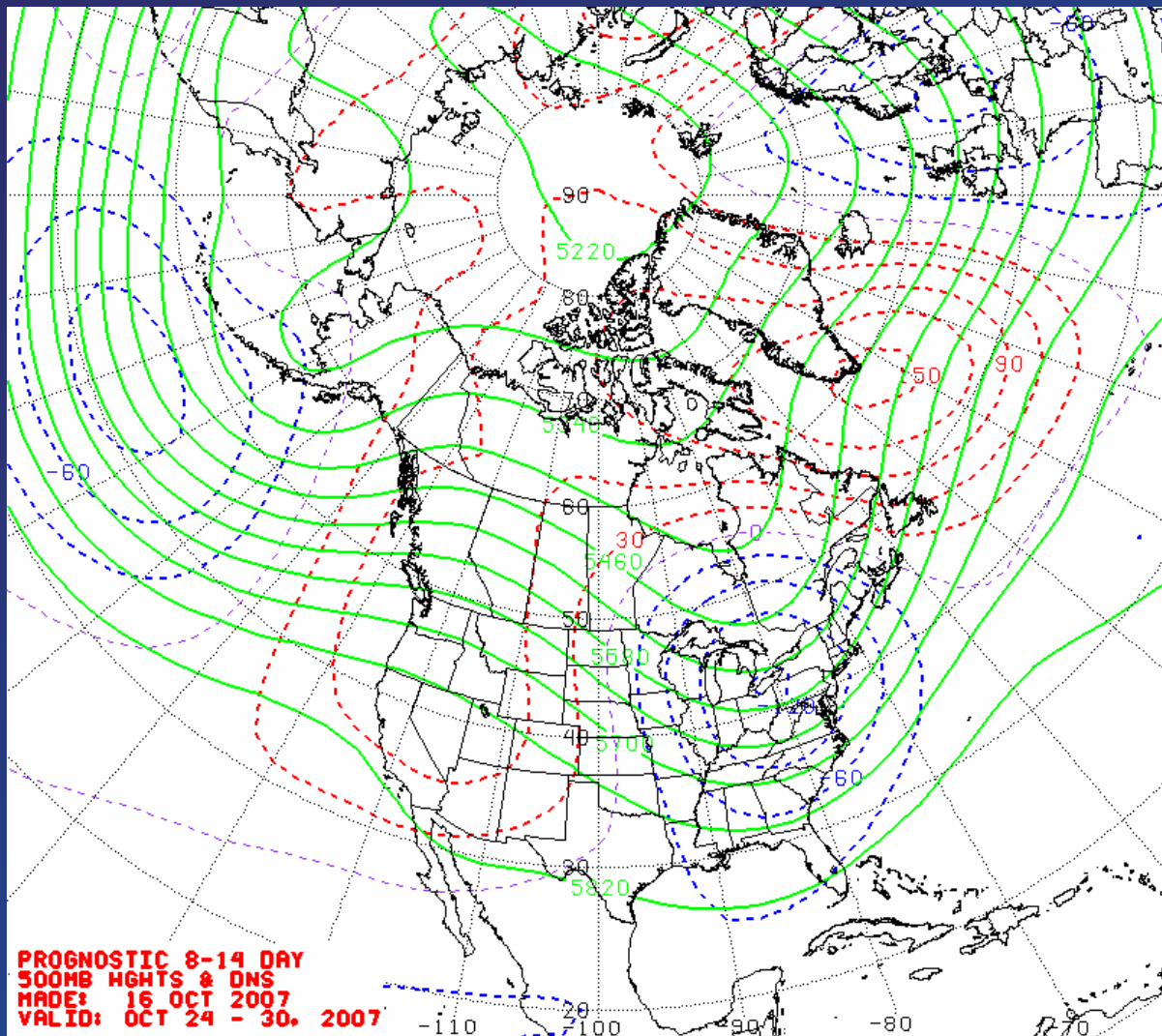
- West and central – 50% to 60% chance of above normal temperatures
- East – 40% to 50% chance of above normal temperatures
- Highs – Upper 50s to lower 60s
- Lows – Upper 20s to lower 30s



- 33% to 40% chance for below normal precipitation north and central
- 40% to 50% chance for below normal precipitation south
- Precipitation – 0.50 to 1.25 inches

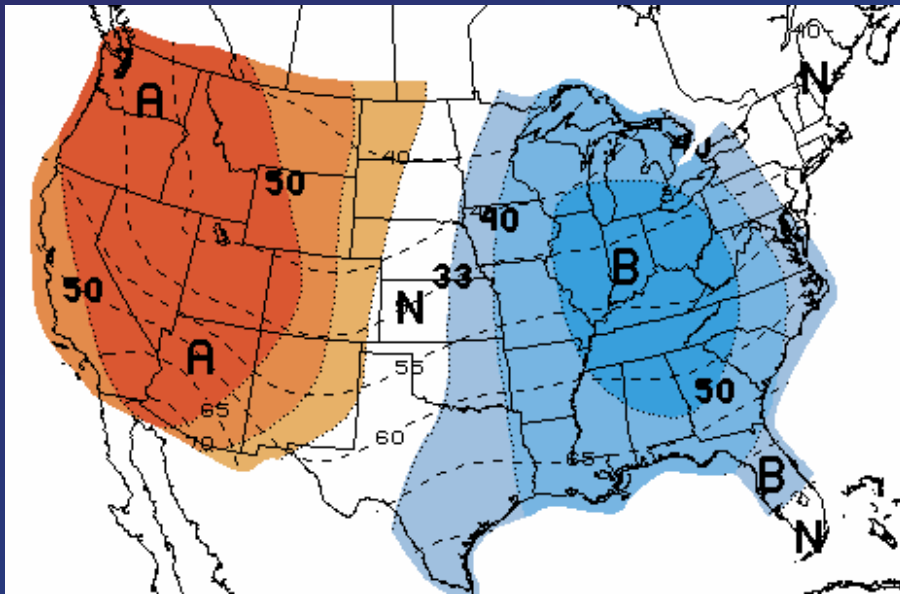
# 8 – 14 Day Forecast

## 500 mb pattern

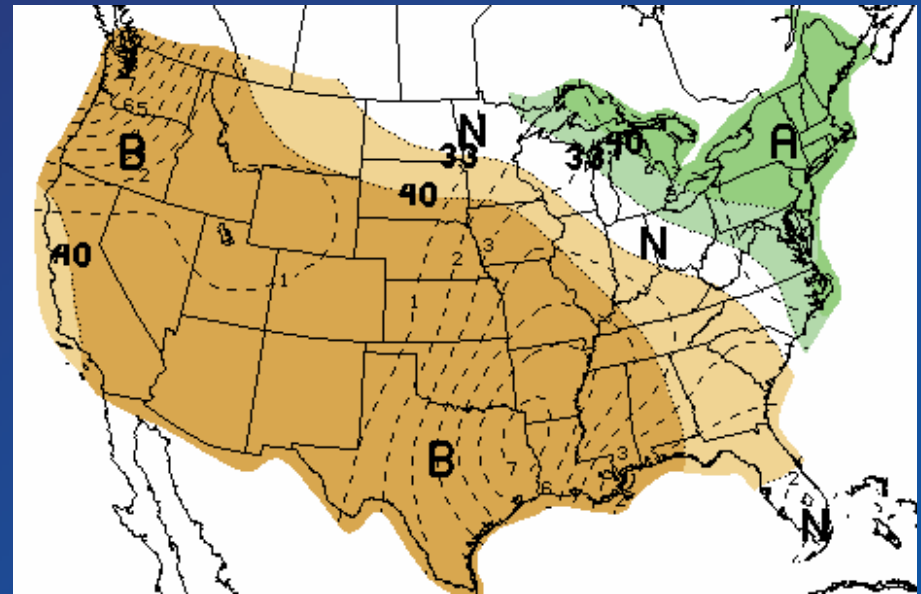


- October 24 - 30
- High pressure ridge over western U.S. weakens

# October 24 - 30



- 💧 **50% - 60% chance for above normal temperatures west**
- 💧 **40% - 50% chance for above normal temperatures central and east**

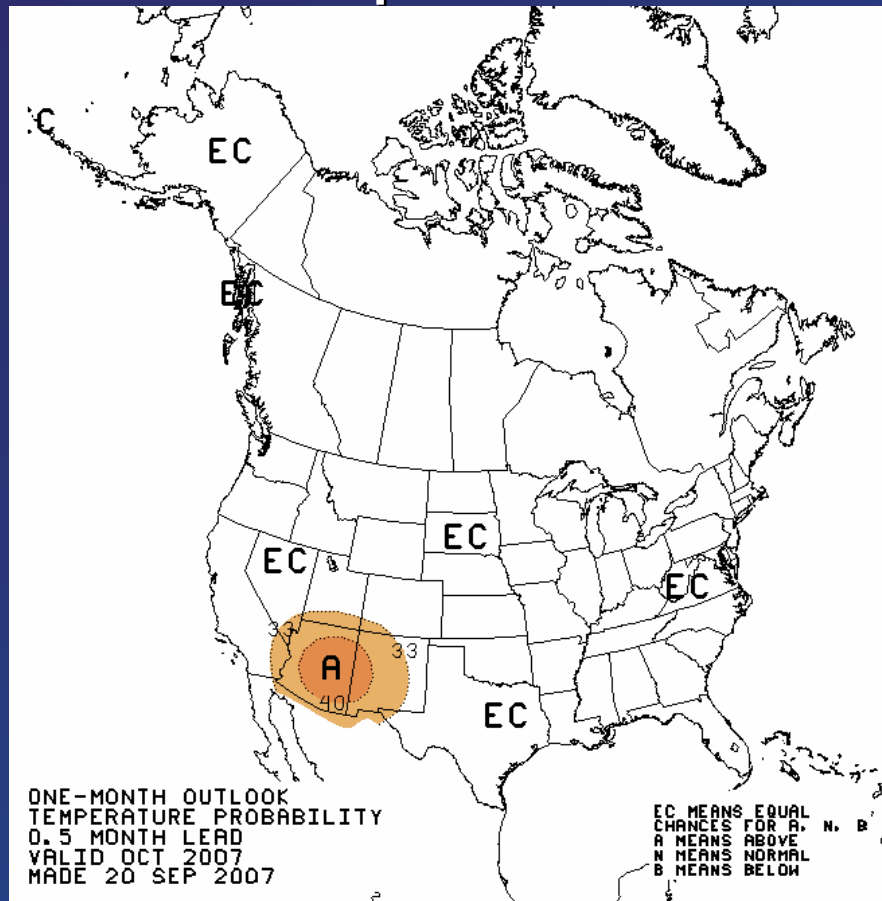


- 40% - 50% chance for below normal precipitation west and south
- 33% - 40% chance for below normal precipitation central and east



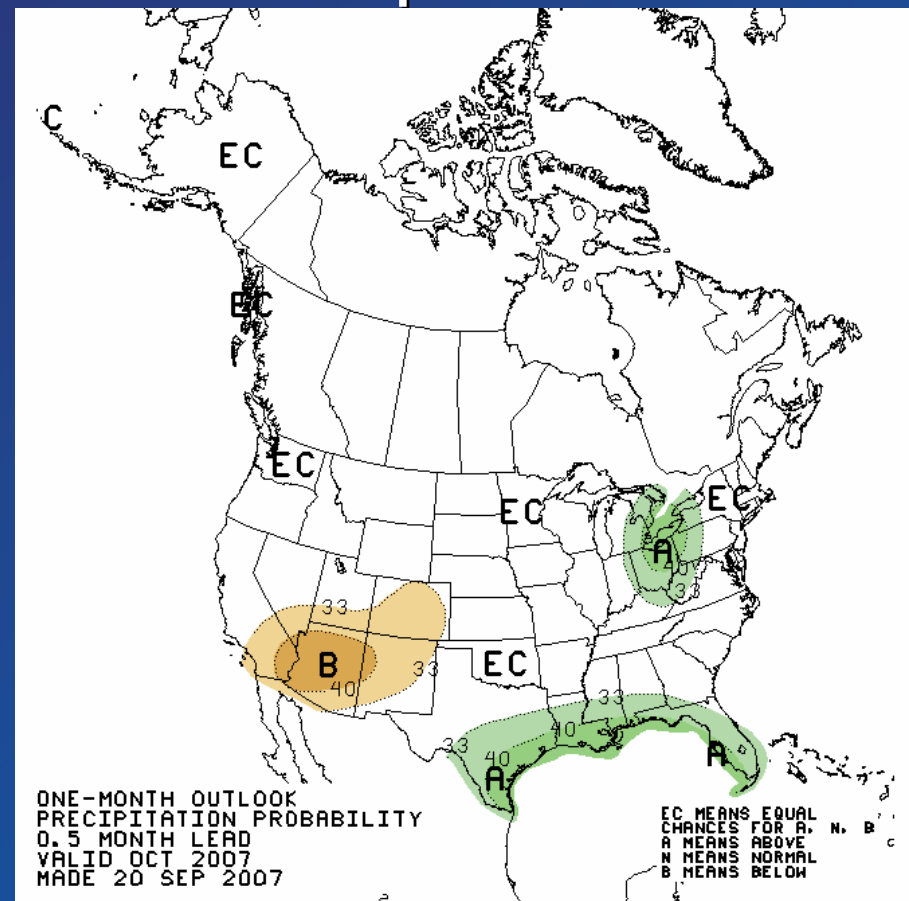
# October Outlook

## Temperature



- 💧 No forecast skill ... Equal chances for above... below or near normal temperatures

## Precipitation

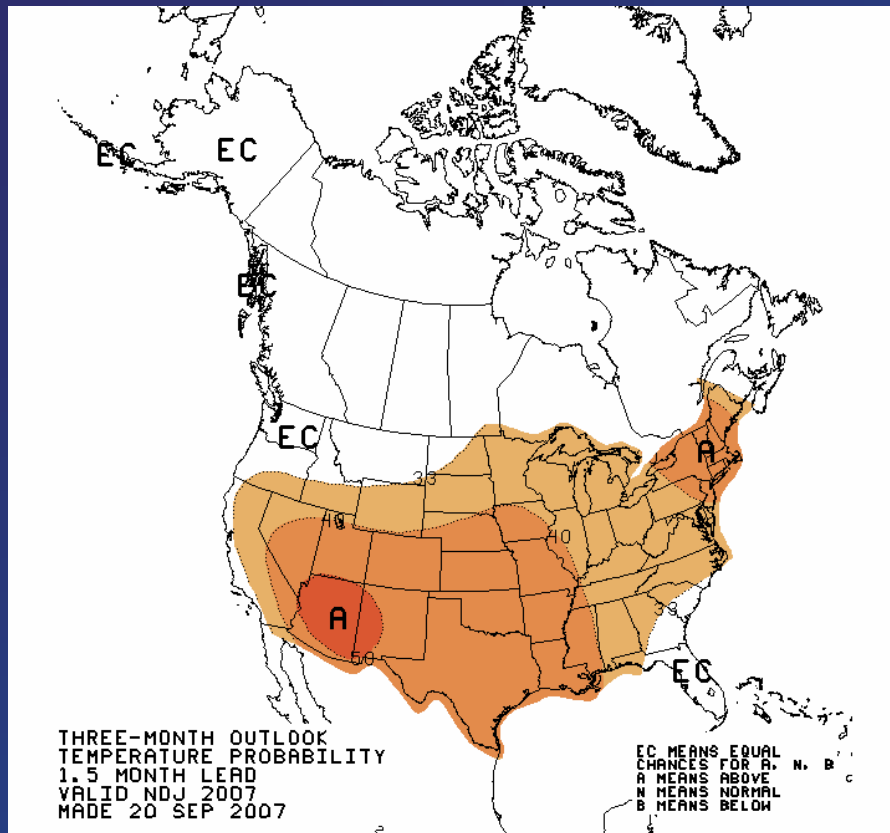


- 💧 No forecast skill ... Equal chances for above... below or near normal precipitation



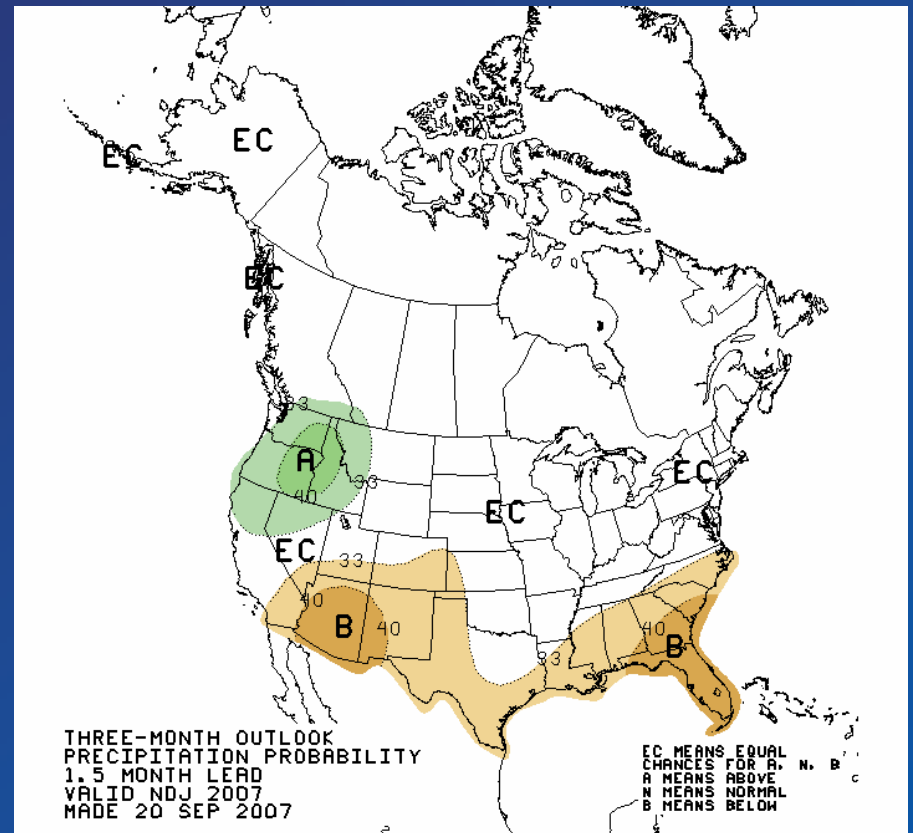
# November - January Outlook

## Temperature



- No forecast skill... equal chances for above, below or near normal temperatures

## Precipitation

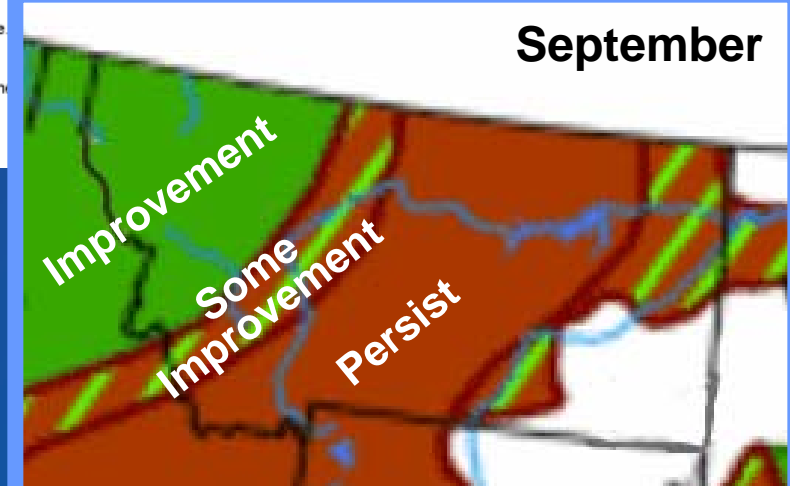
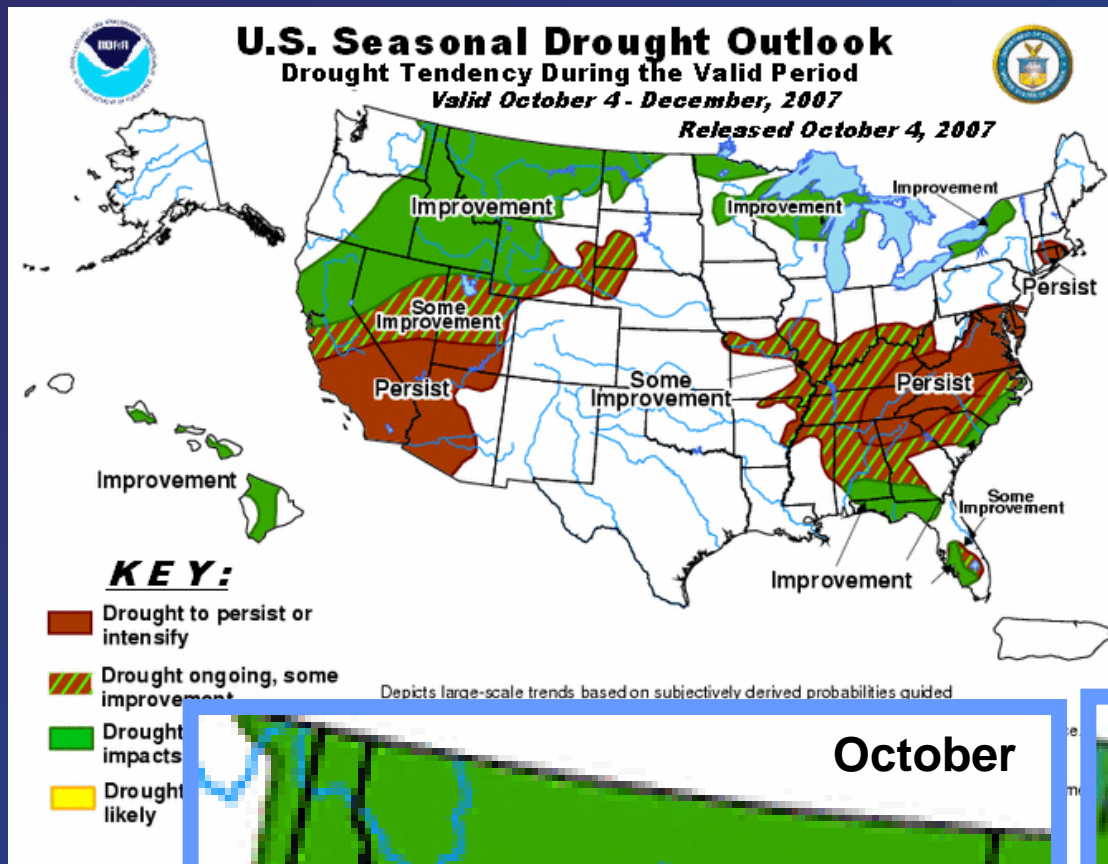


- West – 33% to 40% chance for above normal precipitation
- Central and east – No forecast skill... equal chances for above, below or near normal precipitation

# Drought Outlook through December

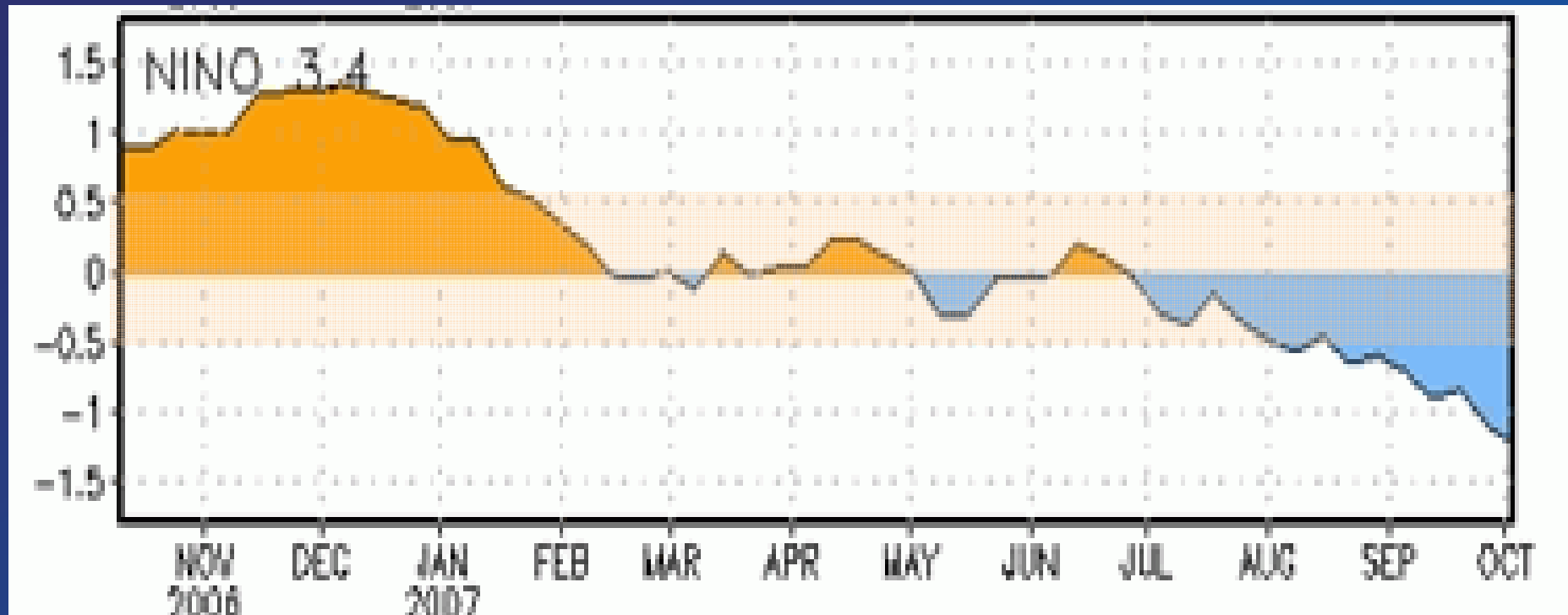
Issued October 4, 2007

- Improvement expected across all drought areas



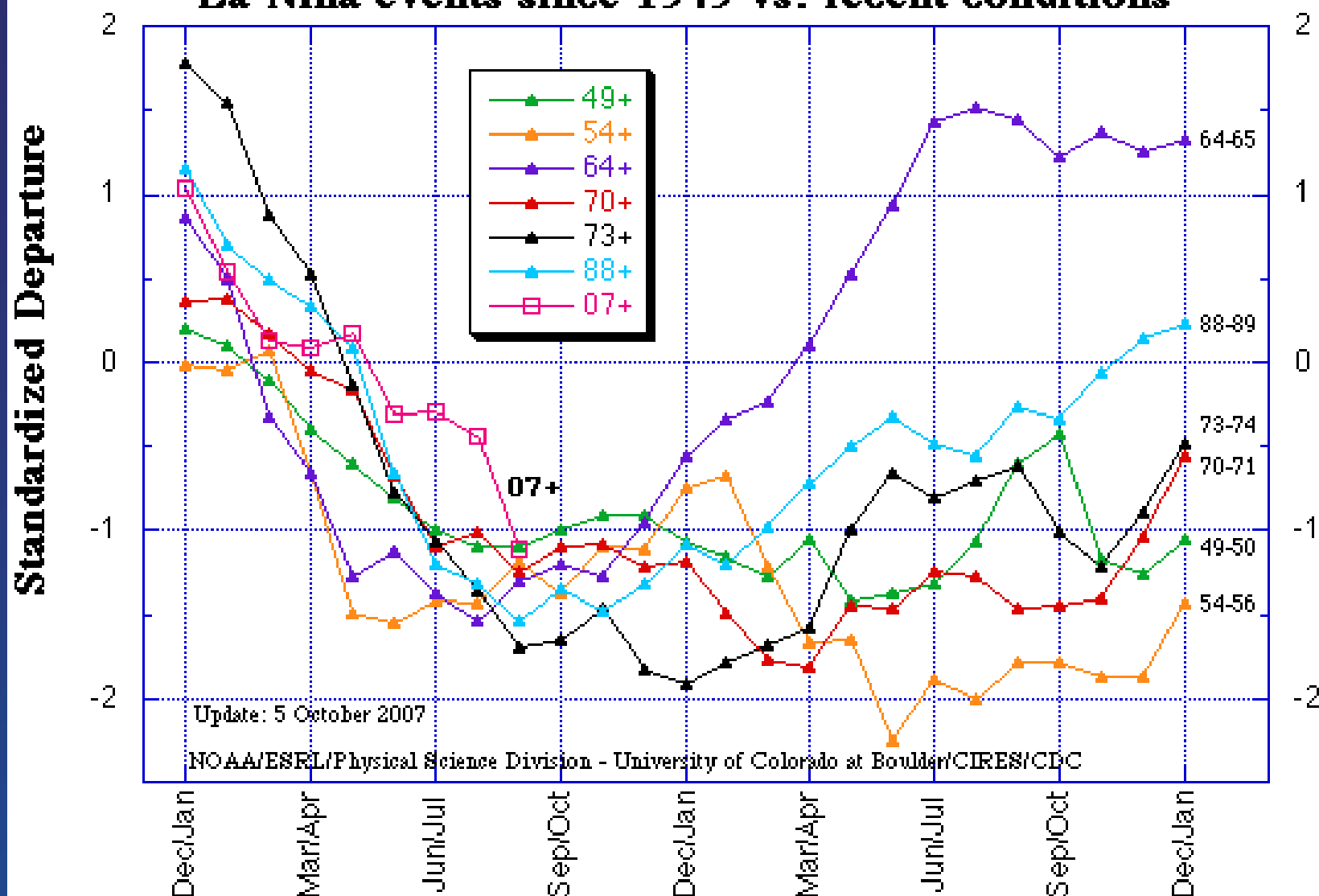
# El Niño / La Niña

- 💧 La Niña will likely continue into early 2008.



# Transition to La Niña

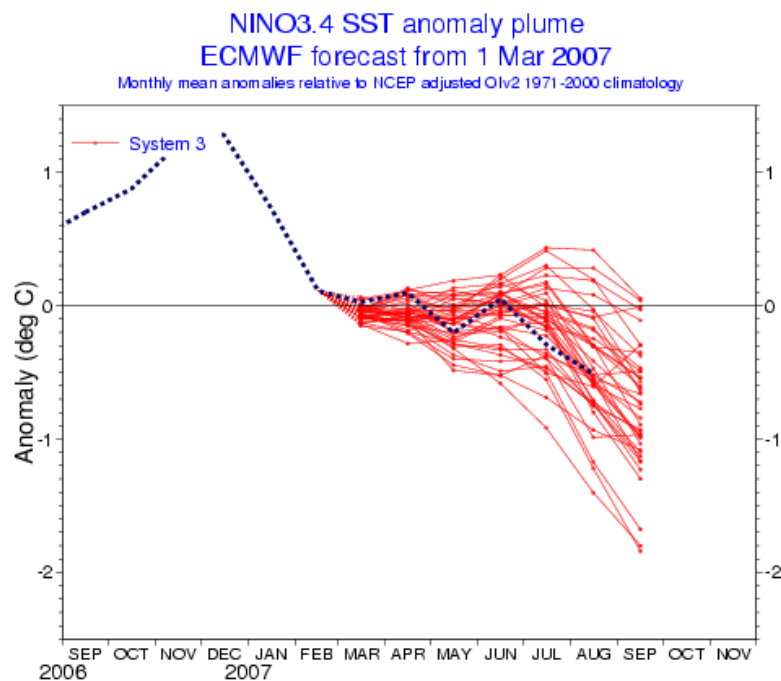
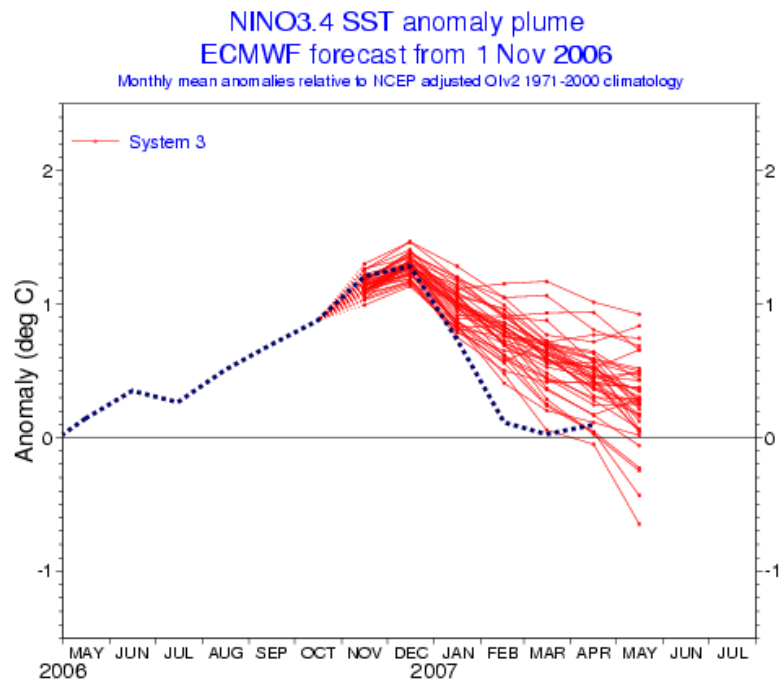
**Multivariate ENSO Index (MEI) for 6 strong La Niña events since 1949 vs. recent conditions**



# ECMWF Forecasts

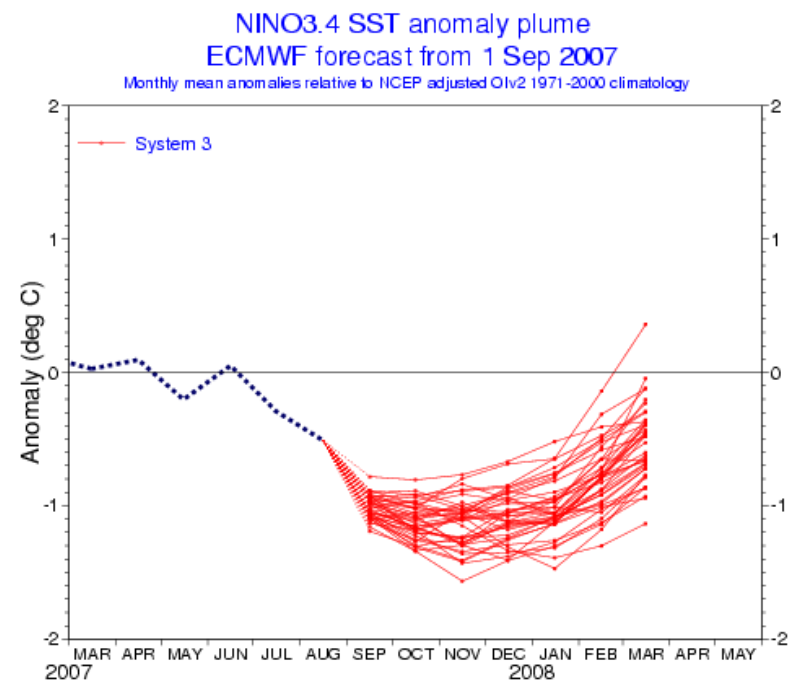
## Sea Surface Temperatures

### Niño3.4 Region



Forecast issue date: 15 Mar 2007

ECMWF



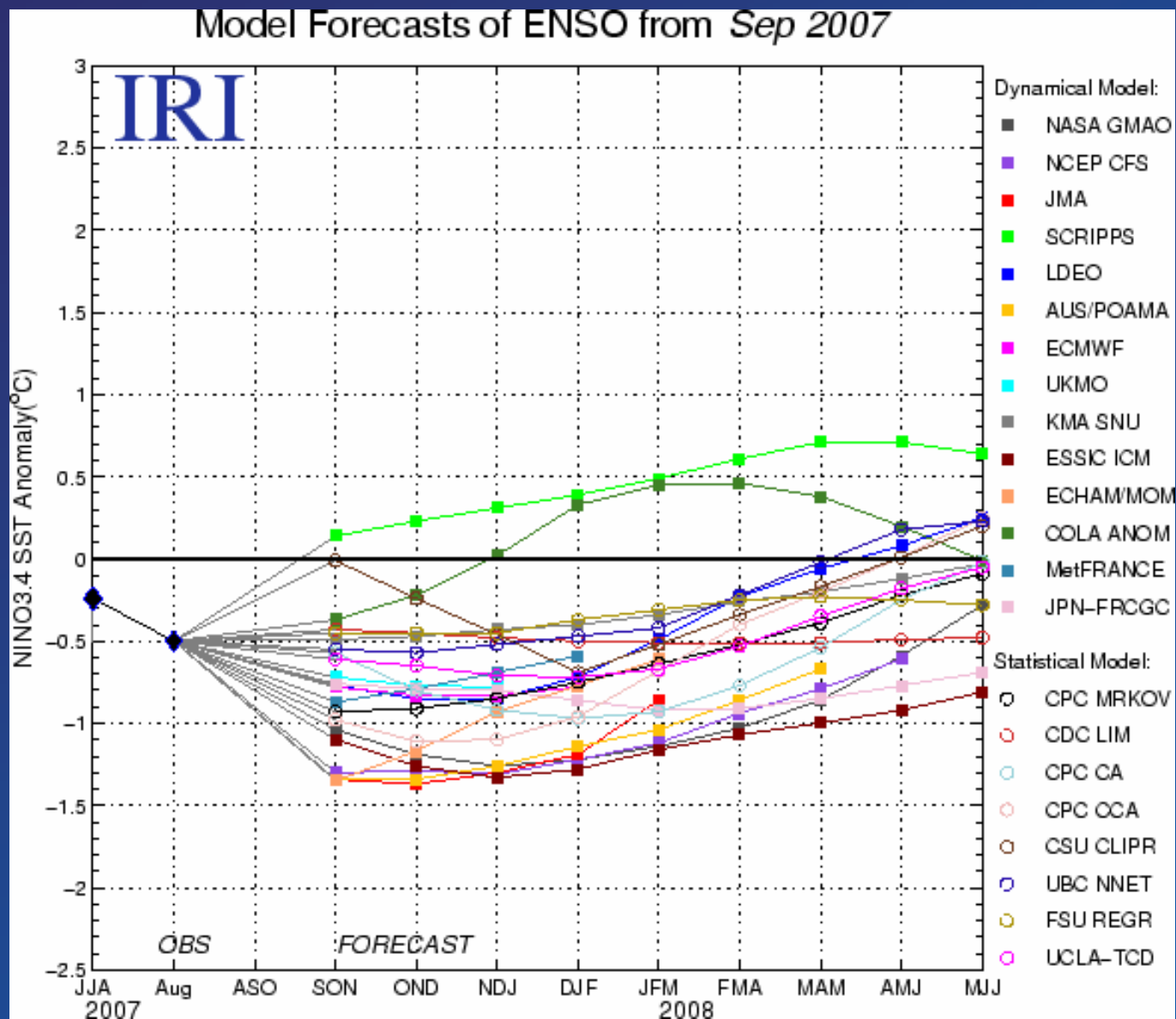
Forecast issue date: 15 Sep 2007

ECMWF



# Model Forecasts

## Sea Surface Temperatures



## To sum up...

- September brought near to above normal precipitation to most of western half of Montana
- October continues wet trend with much of the state receiving more than 150% of normal so far
- Water Year 2007 ended with most of state receiving near to above normal precipitation
  - *Exception northwest and in areas southwest and south central which were below normal*
- Crop year precipitation remained below to well below normal over most of western half of state
- Some minor improvement in drought categories across the state
  - *Both on state assessment and Drought Monitor*
- Moderate La Niña expected to persist through early 2008

**weather.gov**

**weather.gov/billings**

**weather.gov/glasgow**

**weather.gov/missoula**

**weather.gov/greatfalls**